

**UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN**

U.S. WATER SERVICES, INC., and ROY
JOHNSON,

Plaintiffs,

v.

NOVOZYMES A/S and NOVOZYMES NORTH
AMERICA, INC.,

Defendants.

Case No. 3:13-cv-00864-jdp

**NOVOZYMES' RULE 50(a) MOTION FOR JUDGMENT AS A MATTER OF LAW
THAT U.S. PATENT NOS. 8,415,137 AND 8,609,399 ARE INVALID**

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I. INTRODUCTION

Pursuant to Federal Rule of Civil Procedure 50(a), defendants Novozymes A/S and Novozymes North America, Inc. (collectively, “Novozymes”) move for judgment as a matter of law that the asserted claims of U.S. Patent Nos. 8,415,137 (“the ’137 patent”) and 8,609,399 (“the ’399 patent”) are invalid.

II. NOVOZYMES IS ENTITLED TO JUDGMENT OF INVALIDITY AS A MATTER OF LAW

The asserted claims of the ’137 and ’399 patents are invalid. Novozymes has introduced clear and convincing evidence establishing that (1) the asserted claims are anticipated under 35 U.S.C. § 102 because each element of the asserted claims in both patents was disclosed, either expressly or inherently, in a single prior art reference; (2) the asserted claims are obvious under 35 U.S.C. § 103 in light of the prior art; and (3) the asserted claims are invalid under 35 U.S.C. § 112 for failure to satisfy the written description requirement. For the reasons explained below, the Court should grant Novozymes’ motion for judgment as a matter of law. No reasonable jury could find that the asserted claims are not anticipated or obvious, nor could a reasonably jury conclude that the inventors possessed the claimed invention as of the priority filing date.

A. Legal Standard

Federal Rule of Civil Procedure 50(a)(1) provides:

If a party has been fully heard on an issue during a jury trial and the court finds that a reasonable jury would not have a legally sufficient evidentiary basis to find for the party on that issue, the court may: (A) resolve the issue against the party; and (B) grant a motion for judgment as a matter of law against the party on a claim or defense that, under the controlling law, can be maintained or defeated only with a favorable finding on that issue.

The Seventh Circuit has explained that the question under Rule 50(a)(1) “is simply whether the evidence as a whole, when combined with all reasonable inferences permissibly drawn from that evidence, is sufficient to allow a reasonable jury to find in favor of the [nonmoving party].” *Hall*

v. Forest River, Inc., 536 F.3d 615, 619 (7th Cir. 2008). A “mere scintilla” of evidence is not sufficient to survive a Rule 50 motion; there must be “substantial evidence” that “would have permitted the jury to find in the [nonmoving party]’s favor.” *Mut. Serv. Cas. Ins. Co. v. Elizabeth State Bank*, 265 F.3d 601, 612 (7th Cir. 2001).

B. No Reasonable Jury Could Find that the Asserted Patents Are Not Anticipated by Veit as a Matter of Law

In its Final Pretrial Conference Order (Dkt. No. 728), the Court found that in light of its previous summary judgment ruling, the prior art reference Veit (WO 01/62947)¹ expressly teaches all elements of the asserted claims with one exception: reducing the formation of deposits of insoluble phytic acid or phytic acid salts in plants that produce fuel ethanol, which appears in all asserted claims.² Accordingly, for purposes of anticipation, the *only* remaining question for the jury is whether Veit inherently discloses this sole remaining claim element. As described below, reduced formation of phytate deposits necessarily results from the activity of phytase when applied in fermentation, and is thus inherently disclosed by Veit. Accordingly, no reasonable jury could find that the patents are not anticipated under 35 U.S.C. § 102.

To anticipate a claim, a single prior art reference must disclose all of the limitations or elements of the claim, either expressly or inherently. *King Pharm., Inc. v. Eon Labs, Inc.*, 616 F.3d 1267, 1274 (Fed. Cir. 2010). Based on the principle of inherent disclosure, “a prior art

¹ Veit is a published international patent application entitled “Fermentation with a Phytase.” DTX 2069.001. It was published on August 30, 2001, and its priority date of February 23, 2000 predates the filing of U.S. Water’s parent application by more than seven years. *Id.* Veit is assigned to Novozymes A/S. *Id.*

² The Court held that under the doctrine of “the law of the case,” U.S. Water was barred from rearguing issues that were resolved against it in the district court and that were not appealed. Dkt. No. 728, Final Pretrial Conference Order at 23. The Court further held that even if U.S. Water was not barred from relitigating these issues, the Court would adopt its “same positions in the summary judgment opinion (with the exception of the issue the court of appeals found to be disputed).” *Id.* at 24; *see also* Dkt. No. 561, Summary Judgment Opinion & Order.

reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted). In other words, a patent that merely claims newly discovered results of known processes is anticipated by the prior art, even if those results were not expressly recognized in the art. *Id.*; *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1376 (Fed. Cir. 2001) (rejecting plaintiff’s argument that “new uses of old processes are patentable” because, while true, “the claimed process here is not directed to a new use; it is the same use, and it consists of the same steps as described by [the prior art reference]”); *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 633 (Fed. Cir. 1987) (recognition of a new aspect of a known process is not a patentable invention of a novel process).

1. The Evidence Shows that Deposit Reduction Is Merely an Inherent “Result” in the Process Taught by Veit

The only aspect of the claim that Veit does not *expressly* teach is the result of “reducing the formation of deposits of insoluble phytic acid or phytic acid salts.” However, the evidence adduced at trial overwhelmingly shows that Veit inherently discloses this result.

Veit describes “an improved fermentation process wherein phytic acid-containing material is fermented in the presence of a phytase, e.g. in fermentation for the production of ethanol.” DTX 2069.001; *see also* Trial Tr. (Oct. 16, 2017 am) (rough) at 105:24–106:7 (application is teaching “the usefulness of adding a phytase into fermentation”). Novozymes’ technical expert, Dr. Scott Kohl, testified that Veit teaches putting a phytase into fuel ethanol fermentation to break down phytic acid salts in ethanol processing fluids of both wet milling and dry grind production plants. Trial Tr. (Oct. 16, 2017 am) (rough) at 64:6–9; Trial Tr. (Oct. 16, 2017 pm) (rough) at 28:8–15. Dr. Kohl testified that Veit teaches that phytase can be added

during fermentation. Trial Tr. (Oct. 16, 2017 am) (rough) at 114:25–115:9; *id.* at 116:15–117:1 (“So Veit is teaching correctly that you add the phytase very early on at the beginning of fermentation . . .”). And when phytase is added during fermentation, it acts as phytase always does: by breaking down phytates, including phytate-based deposits. *Id.* at 60:10–62:15 (describing the “phytase reaction” whereby the phytase enzyme reacts with phytate and works to break down phytic acid or salts of phytic acid and produce soluble products); *id.* at 110:21–111:10 (Veit 7:30–36 describes “that the phytase will convert phytates into phosphates,” which is the “reaction that we saw earlier where the phytase clips off those phosphate groups and they become what’s called orthophosphate or phosphate groups.”); *id.* at 117:5–118:11 (the inventor “wants to put [in] the phytased [sic] and his reason is to break down the phytic acid” and describing the reaction that occurs when you put insoluble phytate in the presence of phytase).

Importantly, Dr. Kohl testified that Veit includes an actual example, Example 1, of fermentation in the presence of a phytase. Trial Tr. (Oct. 16, 2017 pm) (rough) at 6:9–12, 6:20–22, 7:3–13. Specifically, Dr. Kohl testified that following incubation with 1.0 FYT/g phytase, “the phytase efficiently hydrolyzes the phytin to below detection level.” *Id.* at 7:14–19; DTX 2069.018 (Veit Example 1 states that “phytase efficiently hydrolyses the phytin below the detection level”). As Dr. Kohl testified, a person of ordinary skill in the art would understand this to mean “the phytase destroyed all the phytate, all the phytic acid salts, and they are no longer present. They’re broken down.” Trial Tr. (Oct. 16, 2017 pm) (rough) at 7:20–24; *see also id.* at 9:21–25 (Dr. Kohl testified that Veit Figure 3 shows a person of ordinary skill in the art “that the fermentation in the presence of a glucoamylase and a phytase can reduce all of the phytic acid salts in the fermentation”). And—as admitted by U.S. Water’s experts—“[i]f there is no phytate present, it is impossible to get a fouling from phytate.” *Id.* at 7:25–8:3; Trial Tr.

(October 17, 2017 am) (rough) at 140:22 –141:4 (U.S. Water’s expert, Keith Flanagan, admitted that if Veit’s reporting is correct, if there is “really truly nothing left at the end then I don’t think phytic acid fouling in deposits will occur”); *id.* at 68:7–15 (Mr. Dorn testified that “[i]f all of the phytic acid salts are decomposed, then they could not participate in deposit formation.”). In other words, when phytin is undetectable, there is no phytin, and if there is no phytin, there can be no phytin-based deposits. *See id.* at 10:1–25. Veit therefore inherently discloses the natural result of adding phytase: a reduction in phytate-based deposits. *Id.* at 15:8–14 (Dr. Kohl testified that “[i]f you follow the teachings of Veit, you will necessarily reduce the formation of insoluble deposits”).

Dr. Kohl further testified regarding the dosage ranges that Veit says can be used to practice the teaching. *Id.* at 11:1 –7. Veit discloses that the dosage of phytase may be in the range 5.000-250.000 FYT/g DS, and lists three preferred suitable ranges as follows: a preferred suitable dosage of the phytase is in the range from 0.005–25 FYT/g DS (“preferred suitable”), preferably 0.01–10 FYT/g, such as 0.1–1 FYT/g DS (“narrowest preferred”). DTX 2069.009 at column 8, lines 8–15; Trial Tr. (October 16, 2017 am) (rough) at 107:7–20; Trial Tr. (Oct. 17, 2017 am) (rough) at 139:14–19 (Mr. Flanagan agrees that 1 FYT/g DS is the narrowest preferred range described by Veit). Dr. Kohl testified that he reviewed the specific dosages used by Kansas Ethanol, Nesika, Calgren, Aemetis, Dakota Ethanol and Southwest Georgia Ethanol, and compared that data to the dosage ranges disclosed by Veit. Trial Tr. (October 16, 2017 am) (rough) at 108:5–11; Trial Tr. (October 16, 2017 pm) (rough) at 11:20–12:2. Dr. Kohl testified that all six plants added the phytase as taught by Veit (in fermentation), and further that all six plants dosed within all three of Veit’s preferred suitable ranges, including the *narrowest* preferred range. Trial Tr. (October 16, 2017 pm) (rough) at 12:3–23, 14:1–6; Trial Tr. (October

16, 2017 am) (rough) at 108:5–11. Dr. Kohl further testified that although Veit does not explicitly teach reduced formation of phytate deposits, the six plants experienced such reduced fouling by using the dosage ranges in Veit because Veit teaches a reaction that will *necessarily* break down phytic acid in fermentation, which leads to a reduction of phytate deposits. Trial Tr. (October 16, 2017 pm) (rough) at 14:10–19; *id.* at 105:8–106:2 (Dr. Kohl testified that pHytOUT is a diluted product, and that one of the plants using pHytOUT dosed at only three times more than the Veit minimum of 0.005 FYT/g DS).

Indeed, U.S. Water’s expert Mr. Dorn readily admitted that plants purchase and use phytase because it works to reduce fouling, and that plants dosing in the range recommended by Novozymes (which is which is within the narrowest preferred range of Veit) *necessarily* experienced a reduction of deposits. Trial Tr. (Oct. 11, 2017 pm) (rough) at 46:25–47:5 (“Q. How do you know that deposit reduction using Phytaflow is accomplished substantially by phytase? A. Well, quite simply . . . so whether Phytaflow was added or phytase was added based on my experience and the experience of the plants that we deposed, you add it, and the fouling is reduced, and they have a benefit.”); *id.* at 57:1–6 (“So if a plant is able to use pHytOUT or use Phytaflow and able to reduce the amount of sulfuric acid that they’re putting in the beer well or the beer feed line specifically to help with their fouling issues, it’s pretty obvious that the reason why that’s happening is that the phytase is working and it’s reducing the deposit. It’s really not very difficult.”); Trial Tr. (Oct. 12, 2017 am) (rough) at 22:3–15 (“Q. But you have concluded that all the remaining Novozymes customers who use phytase do reduce deposits, phytate-type deposits, correct? A. Yes, because, as I mentioned yesterday, based on my experience in fuel ethanol plants, a plant will not buy and use an enzyme unless it works, it does what the manufacturer says it’s going to do, and it’s cost effective for them to do that. So the fact that the

plants are buying and using the product, following the application sheet and having success, and the consistent result that we received on those other eight plants; in my personal experience, I concluded -- I made that conclusion, yes, sir.”).

In other words, the data from these six plants are extrinsic evidence that carrying out the methods of Veit by adding phytase in fermentation within the narrowest recommended range results in a reduction in deposits, which is further evidence, beyond the principles of science to which Dr. Kohl testified, that reduced formation of phytase deposits is inherently disclosed by Veit. Trial Tr. (October 16, 2017 pm) (rough) at 15:8–14 (“If you follow the teachings of Veit, you will necessarily reduce the formation of insoluble deposits.”). Accordingly, Mr. Kohl concluded that claims 1, 6, and 12 in the ’137 patent, and claims 1, 2, 5, 7–9, 16, and 18–20 of the ’399 patent are invalid as anticipated by Veit. *Id.* at 15:25 –16:23.

U.S. Water offered no reliable evidence to rebut Dr. Kohl’s testimony that use of the narrowest preferred dosage range disclosed in Veit will necessarily experience a reduction in deposits. To the contrary, U.S. Water’s expert Keith Flanagan admitted that Example 1 (which uses a dose of phytase within that narrowest range) necessarily discloses reduced formation of phytate deposits. Trial Tr. (October 17, 2017 am) (rough) at 140:22 –141:4 (U.S. Water’s expert, Keith Flanagan, admitted that if Veit’s reporting is correct, if there is “really truly nothing left at the end then I don’t think phytic acid fouling in deposits will occur”).

On the other hand, Mr. Flanagan’s rebuttal to Novozymes’ evidence regarding the necessary result of the method disclosed in Veit, reflects that his entire testimony was based on an incorrect legal framework.

First, Mr. Flanagan made a mistaken assumption about what a person of ordinary skill in the art is deemed to have known. Specifically, Mr. Flanagan testified that he didn’t think that a

person of ordinary skill in the art “is someone who has an encyclopedic knowledge of” information, including regarding the availability and suitability of phytases. Trial Tr. (Oct. 17, 2017 am) (rough) at 122:13–17. But the law requires just that: the person of ordinary skill is a hypothetical person who is presumed to be aware of *all the pertinent prior art*. *Takeda Chem. Indus., Ltd. v. Alphapharm Pty., Ltd.*, 492 F.3d 1350, 1363 (Fed. Cir. 2007) (“The person of ordinary skill is a hypothetical person who is presumed to be aware of all the pertinent prior art.” (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955 (Fed. Cir. 1986))).

Even more importantly, the soundness of Mr. Flanegan’s testimony suffers because he directed his opinions to issues that are legally irrelevant. Mr. Flanegan focused repeatedly on a single dosage (the lowest dosage) mentioned in Veit and opined that Veit does not anticipate the asserted claims because deposits might not be reduced at that lowest dosage. Trial Tr. (Oct. 17, 2017 am) (rough) at 96:17–21; 99:4 –8; 100:22–101:12; 142:12 –143:4. In effect, Mr. Flanegan assumes that to be anticipatory, *every disclosed embodiment* in a reference must be anticipatory. But it is an “erroneous assumption that the disclosure of multiple examples renders one example less anticipatory.” *Leggett & Platt, Inc. v. VUTEk, Inc.*, 537 F.3d 1349, 1356, (Fed. Cir. 2008). Therefore, even in the inherency context, a single embodiment that inherently (necessarily) anticipates is sufficient to invalidate a patent, even if the disclosure also contains embodiments that do not. *Id.*

Moreover, although Veit discloses phytase dosage ranges of varying specificity, Example 1 discloses a single dosage point (1 FYT/g) that degrades all phytate and thus necessarily reduces formation of phytate deposits. No more is required to anticipate the asserted claims, even for those claims that require dosing within a range. *See Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1346, 1349–50 (Fed. Cir. 1999) (affirming judgment of anticipation where district court

had determined that at a particular point within a range, “which [is] common to the [Asserted] Patent” and the prior art, “there is *inherently* sufficient aeration” (emphasis added)); *Ineos USA LLC v. Berry Plastics Corp.*, 783 F.3d 865, 869 (Fed. Cir. 2015) (“When a patent claims a range, as in this case, that range is anticipated by a prior art reference if the reference discloses a point within the range.”). And even if that were not the case, there is no dispute that Veit’s preferred dosages ranges fall entirely within the dosage ranges of the asserted claims. U.S. Water has offered no evidence that any particular dosage or range of dosages is “critical” within those claimed ranges. *Ineos*, 783 F.3d at 869–70 (holding that where prior art discloses its own range rather than a specific point, the prior art anticipates unless the patentee demonstrates that “the range claimed is critical to the operability of the invention”).

Mr. Flanagan’s misapprehension of the law of anticipation renders his testimony on invalidity irrelevant. Under the correct legal standard, it is clear that the embodiments disclosed in Veit inherently anticipate the asserted patents.

In addition, U.S. Water cannot avoid the doctrine of inherent anticipation simply by introducing evidence that the asserted patents claim a method that has a different “goal” or “purpose” than the method disclosed in Veit. Where, as here, “there is no manipulative difference in the physical steps in the asserted claims as compared to those in the prior art,” the prior art will anticipate. *GlaxoSmithKline LLC v. Glenmark Pharms. Inc.*, No. 14-cv-877, 2017 WL 2290141, at *2 (D. Del. May 25, 2017). It is immaterial whether one who is skilled in the art would practice the method disclosed in Veit for the *purpose* of combatting fouling, or even whether the inventors of Veit appreciated every possible result of using phytase to break down phytic acid in ethanol production. *See Leggett & Platt*, 537 F.3d at 1356 (“Finally, [the patent holder] repeatedly compares the purpose of the ’823 patent to the purpose of the ’518 patent, but

we fail to see how this comparison proves that the latter's claim is not anticipated by the former's disclosure."); *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1376 (Fed. Cir. 2005) ("[I]nherency is not necessarily coterminous with knowledge of those of ordinary skill in the art. Artisans of ordinary skill may not recognize the inherent characteristics or functioning of the prior art."); *see also Schering*, 339 F.3d at 1377 ("[T]his court rejects the contention that inherent anticipation requires recognition in the prior art."). What matters here is whether the prior art discloses conditions in at least one embodiment that will necessarily result in phytase reducing deposits. As described above, Novozymes has proven through clear and convincing evidence that the prior art discloses exactly that.

The evidence establishes that, at best, U.S. Water discovered nothing more than the fact that certain fuel ethanol plant deposits consist of phytate, although even that too was known in the art and, according the patents' specification, could be easily discovered using "standard methods." Trial Tr. (Oct. 17, 2017 am) (rough) at 52:14–8 (Mr. Dorn testified that identifying the deposit composition helps "drive you to the solution"); Dkt. No. 776, Young Dep. Tr. at 281:24-283:04, 283:11-284:21, 285:09-23, 288:23-289:22; DTX 2398; DTX 2368; DTX-2001.003 at 4:2-7 ("The insoluble material may be identified by standard methods known to those of skill in the art, including dry analysis methods such as x-ray fluorescence (XRF) or oxidation, followed by elemental analysis, for example, or wet analysis methods such as acid-base neutralization reactions, for example."); *see also* DTX 2001.005 at 8:43-44 ("To determine the content of the solid deposit in the beer column, X-ray fluorescence (XRF) analysis was used.").

Yet U.S. Water's claims are directed to the same method described in Veit, merely geared toward a different subjective purpose or goal. This is not patentable. *Bristol-Myers*

Squibb, 246 F.3d at 1376. If U.S. Water’s patents were valid, it would give U.S. Water the ability to take away from the methods disclosed in Veit and already available to the public, simply because the asserted patents identify an additional *benefit* to practicing those same methods. This result would run afoul of the “basic principle” of patent law that “[t]he public remains free to make, use, or sell prior art compositions or processes, regardless of whether or not they understand their complete makeup or the underlying scientific principles which allow them to operate.” *Atlas Powder*, 190 F.3d at 1348. The purpose of the inherent anticipation doctrine is to enforce this “basic principle,” and prohibit a party like U.S. Water from claiming the use of the *same method*, under the *same circumstances*, already disclosed in the prior art merely because it claims to have recognized an inherent benefit of that prior art method.

Accordingly, no reasonable jury could find that the asserted patents are not anticipated by Veit.

C. No Reasonable Jury Could Find that the Asserted Patents Are Not Obvious Over the Combination of Veit and Caransa

To the extent a reasonable jury could find that Veit does not inherently disclose “reducing the formation of deposits of phytic acid and/or phytic acid salts” limitation, the claims are *still* invalid as obvious over the combination of Veit in view of U.S. Patent No. 4,914,029 (“Caransa”).

A patent is invalid “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date . . . to a person having ordinary skill in the art.”³ 35 U.S.C. § 103. A “combination of

³ The parties have defined a person of ordinary skill in the art of the asserted patents as follows: “A person of ordinary skill in the field of the invention of the patents-in-suit is someone who has at least a bachelor’s degree in a relevant discipline such as chemical engineering, chemistry or biochemistry, at least two years of experience working in a grain-based fuel ethanol processing

familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

1. Caransa Discloses Deposit Reduction Using Phytase

Caransa is an issued U.S. patent entitled “Process For Steeping Cereals With A New Enzyme Preparation.” DTX 2050. It was filed on September 12, 1988 and issued on April 3, 1990. *Id.* Caransa predates the filing of U.S. Water’s patent application by more than seventeen years.

As Dr. Kohl testified, Caransa is specifically directed to using phytase to eliminate or reduce phytic acid in a wet milling process. Trial Tr. (Oct. 16, 2017 am) (rough) at 64:3–6, 90:14–17. Wet milling is a well-known method of fuel ethanol production that has been used since the 1980s. *Id.* at 39:3–10; *see also* Trial Tr. (Oct. 17, 2017 am) (rough) at 145:9–10 (Mr. Flanagan admitting that “[m]ost of the fuel ethanol plants in the 1980s were wet mills”). According to Dr. Kohl, Caransa discloses the issue of fouling deposits in two ways. First, phytic acid and salts of phytic acid in corn steep liquor deposit as a sludge in fuel ethanol processing equipment. Trial Tr. (Oct. 16, 2017 pm) (rough) at 23:1–4; *see also* DTX 2050.002 at 1:40–45. Second, during microbial fermentation, phytic acid forms a precipitate (*i.e.*, a deposit) inside the fermenter that is “hard to scrub off” and interferes with processing. Trial Tr. (Oct. 16, 2017 pm) (rough) at 23:17–25; *see also* DTX 2050.002 at 1:46–52; Trial Tr. (Oct. 17, 2017 am) (rough) at 150:15–19 (Mr. Flanagan admitting that Caransa teaches a precipitate in fermenters). Dr. Kohl

facility, and an understanding of (i) the operation of a fuel ethanol processing plant, including methods employed for inline cleaning processes as well as for reduction of deposit build-up on internal surfaces in plant equipment, (ii) processes and chemistry of ethanol production, including the use of enzyme solutions, and (iii) functions, uses and characteristics of enzymes. Such knowledge and understanding can be the product of a variety of experiences such as research, training, and experience in designing and/or operating an ethanol plant and/or consulting with respect to such a plant.” Dkt. No. 731, Notice of Parties’ Agreement to Definition of Person of Ordinary Skill in the Art.

explained that Caransa teaches reducing deposit formation by steeping corn in the presence of a phytase. Trial Tr. (Oct 16, 2017 pm) (rough) at 24:14–24; *see also* DTX 2050.002 at 2:11–14. This is apparent from Caransa’s disclosure of “phytin-degrading enzymes” (*i.e.*, phytases) to create corn steep liquor “that does not contain phytin” and which is geared toward “microbial fermentations.”⁴ Trial Tr. (Oct. 16, 2017 pm) (rough) at 20:16–22, 23:1–9, 25:4–8 (referring to DTX 2050.003 at 3:40–45); Trial Tr. (Oct. 17, 2017 am) (rough) at 151:20–24 (Mr. Flanagan admitting “I agree that Caransa does teach adding phytase to corn steep liquor, the steeping process, to reduce phytic acid. So I think they say eliminate or reduce . . .”). In this way, Caransa expressly teaches the same basic phytase reaction later taught by Veit *and the same benefit* subsequently claimed by U.S. Water. Trial Tr. (Oct. 16, 2017 pm) (rough) at 25:11–20.

Dr. Kohl explained that Caransa is not merely theoretical. *Id.* at 26:5–8. Not only does it disclose the origins of phytin-based fouling and the solution of using phytase, but it also provides *actual lab results*. *Id.* According to Dr. Kohl, the Caransa testing measured phytin levels during incubation of corn steep liquor in the presence of a phytase. *Id.* at 26:20–24; *see also* DTX 2050.004 at 5:22–48. The incubation showed that Caransa reduced phytin “all the way down to zero.” Trial Tr. (Oct. 16, 2017 pm) (rough) at 26:17–24. And as Dr. Kohl testified, if there is no phytin, there can be no phytin-based deposits. *Id.* at 27:15–17; *see also* Trial Tr. (October 17, 2017 am) (rough) at 140:22 –141:4 (Mr. Flanagan admitting as to Veit that if there is “really truly nothing left at the end then I don’t think phytic acid fouling in deposits will occur”); *id.* at 68:7–15 (Mr. Dorn testified that “[i]f all of the phytic acid salts are decomposed, then they could not participate in deposit formation”). Therefore, a person of ordinary skill in the art would readily understand what Caransa discloses in multiple ways: that phytases reduce phytin-based

⁴ Dr. Kohl confirmed that the terms “phytate,” “phytin,” “salts of phytic acid,” and “phytic acid salts” are interchangeable. Trial Tr. (Oct. 16, 2017 am) (rough) at 57:22–58:7.

deposits, including phytic acid and salts of phytic acid, in fluid that is used in the production of fuel ethanol.

2. A Person of Ordinary Skill Would Be Motivated to Combine the Teachings of Veit and Caransa

A person of ordinary skill in the art, having been introduced to Veit, would be motivated to combine Veit's teachings with those of Caransa. As Dr. Kohl testified, a person of skill would understand that Caransa teaches using phytase to actually reduce deposits in wet milling fuel ethanol production. Trial Tr. (Oct. 16, 2017 pm) (rough) at 17:20–18:5, 27:22–24. Therefore, it expressly discloses the “reducing deposits” requirement of the asserted claims. *See id.* at 24:14–24, 27:15–17. Veit, similarly, teaches a method of using a phytase to break down phytic acid in fuel ethanol production. *Id.* at 27:24–28:2. Veit further teaches that that invention should be used in both wet milling and dry milling fuel ethanol production. *Id.* at 28:8–15. Indeed, although U.S. Water attempts to argue that the teachings of Caransa are far afield of Veit,⁵ the *inventors themselves* located Caransa and submitted it to the Patent Office. Trial Tr. (Oct. 17, 2017 am) (rough) at 147:18–24 (Mr. Flanagan conceding that the inventors thought Caransa was relevant). The Examiner also felt Caransa was relevant to the asserted claims during prosecution, and specifically discussed this art in an office action rejecting earlier versions of the claims. DTX 2012 at 81.

At bottom, Dr. Kohl explained that (1) Veit teaches the use of phytase in wet milling and dry grind fuel ethanol production; and (2) Caransa teaches an improvement to wet milling by using phytase to degrade phytate in corn steep liquor, thus reducing formation of phytate deposits during fuel ethanol production. As Dr. Kohl testified, a person of ordinary skill in the

⁵ Mr. Flanagan conceded during his cross-examination that most fuel ethanol plants in the 1980s were wet mills. Trial Tr. (Oct. 17, 2017 am) (rough) at 145:6–146:3.

art would appreciate that following the teachings of Caransa would effectively reduce phytic acid deposits in fuel ethanol equipment, regardless of whether corn is initially processed by milling (dry grind) or steeping (wet mill). *See id.* at 32:20–34:3. Because the asserted claims are directed to no more than “the predictable use of prior art elements according to their established functions” as taught in Veit in view of Caransa, the asserted patents are invalid as obvious. *See KSR*, 550 U.S. at 417.

3. Many of the Secondary Considerations Weigh in Favor of Invalidity, and Regardless, Secondary Considerations Cannot Overcome Novozymes’ Strong Showing of Obviousness

The evidence above is sufficient for the Court to grant judgment as a matter of law of invalidity, as secondary considerations are relevant only in “a close case where all other proof leaves the question of invention in doubt.” *See Dow Chem. Co. v. Halliburton Oil Well Cementing Co.*, 324 U.S. 320, 330 (1945); *see also Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1371 (Fed. Cir. 2011) (“A strong case of *prima facie* obviousness, such as that presented here, cannot be overcome by a far weaker showing of objective indicia of nonobviousness.”). However, to the extent the Court considers secondary considerations, they do not save U.S. Water’s patents from invalidity.

For example, there is no evidence that Novozymes copied U.S. Water’s patent claims. Jeffrey Faller, a Novozymes Director of Key Accounts, testified that Phytaflow is an off-the-shelf rebranding of Novozymes’ Ronozyme P-(L) product, sold since 2006 for use in animal feed. Trial Tr. (Oct. 13, 2017 am) (rough) at 106:11–107:4. Furthermore, Peter Halling, Vice President of Biofuels at Novozymes, testified that the selection of a suitable phytase for effecting phytate degradation in ethanol fermentation had its roots in work dating back to 2000, several years before U.S. Water filed its patent application. *Id.* at 81:25–82:6, 82:15–25; *see also id.* at 142:23–143:2 (Rogers). Indeed, Mr. Faller testified that Novozymes discussed such use of

phytase in fermentation with its customers, including the necessary result of phytase action, i.e., “removing the phytic acid or phytate that would be present in the corn mash.” *Id.* at 96:4–101:15; DTX 2814. Similarly, Genencor (now DuPont) had already commercialized a phytase for use in fuel ethanol production as of at least 2006. DTX 2094.021; Trial Tr. (Oct. 17, 2017 am) (rough) at 128:24–129:14, 133:6–13 (Mr. Flanagan admitting that DTX 2094.021 shows the addition of phytases to “reduce[] phytate” in fermentation); *see also* Trial Tr. (Oct. 16, 2017 am) (rough) at 93:8–12 (Dr. Kohl testifying that DTX 2094 describes the addition of phytases to hydrolyze phytic acid and reduce phytin).

The remaining secondary considerations do not change the result. As Dr. Kohl testified, there is no long-felt but unmet need or failure of others, because there were already many ways of reducing deposits being used in the industry. Trial Tr. (Oct. 16, 2017 pm) (rough) at 31:9–15. “The plants are designed to handle fouling.” *Id.* at 31:18. Dr. Kohl testified that prior to U.S. Water’s patents, plants had cleaning systems or used phytases or other acids. *Id.* at 31:18–22; *see also* Trial Tr. (Oct. 17, 2017 am) (rough) at 144:1–10 (Mr. Flanagan admitting that sulfuric acid and cleaning in place still remain options to reduce fouling).

And U.S. Water certainly has not shown unexpected results. To the contrary, Dr. Kohl testified that phytase necessarily breaks down phytic acid and salts of phytic acid, a fact that has long been known and was not disputed at trial. Trial Tr. (Oct. 16, 2017 pm) (rough) at 32:11–12. Indeed, both Caransa and Veit disclose those properties. *See id.* at 32:12–17. Although Roy Johnson testified that the invention was met with skepticism, *see* Trial Tr. (Oct. 10, 2017 pm) (rough) at 91:15–22, he admitted in that same sentence that U.S. Water “didn’t have credibility” in this area. *Id.* at 91:20–22. Monty McCoy likewise testified that in the absence of personal relationships with plants, U.S. Water’s inexperience would have made it very tough for U.S.

Water to find customers. Trial Tr. (Oct. 17, 2017 am) (rough) at 42:17–19. Mr. McCoy further admitted that the results of the invention were *not* unexpected, as U.S. Water “anticipated there would be a reduction” in deposits from the first trial. *Id.* at 35:17–36:5.

The secondary considerations therefore do not support a finding of non-obviousness. And more to the point, such evidence cannot turn an obvious invention into a non-obvious one. *See Dow Chem.*, 324 U.S. at 330. Together, the combination of Veit and Caransa disclose and emphasize each and every aspect of the invention U.S. Water now claims as its own.

4. U.S. Water Did Not Discover a Non-Obvious Invention

Even beyond the specific Veit and Caransa references, the very process by which U.S. Water arrived at this invention further demonstrates the patents’ obviousness.

In January 2007, Paul Young was an admitted novice with phytases; he had not “even [] heard of phytase at that time.” Dkt. No. 776, Young Depo. Tr. at 23:4–11. He received a publicly available article from a co-worker on January 22, 2007 entitled “Phytase: Basics of Enzyme Function.” *Id.* at 53:23–54:8 (discussing Young Depo. Ex. 1031 (DTX 2398) (“Purdue Article”)). As its title suggests, the Purdue Article describes the “basics” of phytases: what they are, how they act, and specifically what they act *upon*. *See* DTX 2398.002 (“Phytase is the only recognized enzyme that can initiate the release of phosphate from phytin”); *id.* at DTX2398.003–DTX2398.004 (describing “Phytin” and “Phytase”). The Purdue Article also teaches that phytin forms “complexes” with metals like magnesium and that corn contains phytin. *Id.* at DTX2398.003. Two days after receiving the Purdue Article, Paul Young responded “Cool!” and wrote that “I gotta get me some of this phytic acid stuff.” DTX 2368.001 (Young Depo. Ex. 1092). In the same email he wrote, on the basis of what he learned from the Purdue Article, that he expected the deposits he had tested that should large amounts of phosphorus were “likely” magnesium phytate and that, as the Purdue Article expressly stated,

phytase could break down magnesium phytate. *See id.*; *see also* Dkt. No. 776, Young Depo. Tr. at 284:6–21, 285:9–15 (Young testifying that he based certain assumptions on the Purdue Article); DTX 2368.

These facts are not in dispute. What they show is that a person with even less skill than a person of ordinary skill in the art (and indeed, a person who had never before heard of phytase) was able to view a publication on the “basics” of phytase and conclude, in the space of two days, that a phytase could break down phytates in fuel ethanol processing. This is what U.S. Water’s alleged discovery boils down to. And this is what U.S. Water now attempts to characterize as revolutionary, unexpected, and non-obvious. But viewed from any common sense perspective—particularly in view of the detailed disclosures of Veit and Caransa and the state of the art at the time of the invention—there can be no question that this “invention” merely takes what was known about phytases and phytate deposits and applies that pre-existing knowledge in a wholly predictable and scientifically expected way. After all, as U.S. Water’s expert Mr. Dorn agreed, simply knowing that something is a phytate could drive a person toward a phytase. *See* Trial Tr. (Oct. 17, 2017 am) (rough) at 63:6–16. Accordingly, Novozymes is entitled to judgment as a matter of law of invalidity because the asserted claims are obvious.

D. No Reasonable Jury Could Find that the Asserted Claims Are Supported by Adequate Written Description

To satisfy the written description requirement, the specification of the October 17, 2007 parent application to which the asserted patents claim priority must show that the inventors *then possessed* the specific invention that U.S. Water now claims and asserts against Novozymes. *See Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1355 (Fed. Cir. 2010) (en banc).

The evidence at trial falls short of that standard. U.S. Water’s own admissions confirm that two limitations—having a “pH of 4.5 or higher” and “reducing the formation of deposits

substantially by phytase and not by an acid with an oxidizer”—were *not* disclosed in the October 17, 2007 application, but were actively guarded from public disclosure by U.S. Water until years later. In addition, U.S. Water’s evidence shows that the inventors did not even discover aspects of their invention until March 2008. Given this evidence, no reasonable juror could determine that the asserted claims have adequate written description. Novozymes is entitled to judgment as a matter of law that the asserted claims of the ’137 and ’399 patents are invalid for lack of written description.

“[T]he test for sufficiency [of written description] is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.* at 1351. By referring specifically to possession “as of the filing date,” “[t]he written description doctrine prohibits new matter from entering into claim amendments, particularly during the continuation process.” *Agilent Techs., Inc. v. Affymetrix, Inc.*, 567 F.3d 1366, 1379 (Fed. Cir. 2009). Thus, “[t]o obtain the benefit of the filing date of a parent application, the claims of the later-filed application must be supported by the written description in the parent in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention *as of the filing date sought*.” *Anascope, Ltd. v. Nintendo of Am., Inc.*, 601 F.3d 1333, 1335 (Fed. Cir. 2010) (emphasis added) (quotation omitted).

The evidence demonstrates that the following limitations lack adequate written description.

1. The “pH of 4.5 or Higher” Limitation Lacks Written Description

The original claims of the parent application to which the ’137 and ’399 patents claim priority did not include any claims directed to the pH in the beer column. The limitations were added in a 2012 amendment, and “wherein the pH of the ethanol processing fluid in the beer

column is 4.5 or higher during production of [a quantity of] ethanol” now appears in asserted claims 1, 6, and 12 of the ’137 patent, and in asserted claims 2, 16, and 18–20 of the ’399 patent. Judgment as a matter of law of invalidity is appropriate for two reasons.

First, the specification contains no support for the “pH of 4.5 or higher” limitation. At trial, Dr. Kohl testified that this limitation relates to the concept of adding less acid when phytase is used, or “reduced acid feed.”⁶ Trial Tr. (Oct. 16, 2017 pm) (rough) at 34:22–35:1. He testified regarding a number of passages in the specification, and concluded that none supports this limitation. *Id.* at 42:4–22 (explaining that the patent’s mention of “about 4.5” does not support this limitation); *id.* at 43:9–20 (explaining that reference to a pH of 4.0 does not support this limitation); *id.* at 45:22–47:8, 47:16–48:4 (explaining that discussion of an oxidizing agent, an acidic compound and UV light, or an enzyme such as phytase does not support this limitation). Dr. Kohl concluded that based on the evidence, the “pH of 4.5 or higher” limitation lacks adequate written description. *Id.* at 57:19–58:12.

U.S. Water’s expert, Mr. Flanagan, also did not identify support for this limitation. He pointed to one passage in the specification, as well as Tables 1, 2, and 4. Trial Tr. (Oct. 17, 2017 pm) (rough) at 85:16–20. But when asked to identify any reference to a “pH of 4.5 or higher,” let alone a pH measured in the beer column, Mr. Flanagan was unable to do so. *Id.* at 154:8–18, 156:3–24, 157:14–21, 158:4–10. He also admitted that his specification support for the “pH of 4.5 or *higher*” limitation also discloses having a pH *lower* than 4.5, tending to suggest that the inventors had not discovered this aspect of the invention they later attempted to claim in a continuation application. *Id.* at 154:2–7.

⁶ On cross-examination, Roy Johnson admitted that the “pH of 4.5 or higher” limitation is the same as the concept of “reduced acid feed.” Trial Tr. (Oct. 16, 2017 pm) (rough) at 136:22–137:4. Mr. Flanagan testified that to increase the pH, “[y]ou could not add that acid.” Trial Tr. (Oct. 17, 2017 pm) (rough) at 159:11–15.

The fact that neither Dr. Kohl nor Mr. Flanagan was able to find support for the “reduced acid feed” concept is not surprising, because the evidence shows that U.S. Water elected to keep it *as a trade secret* until years after the patent application was filed. In June 2011, U.S. Water contended that some of its trade secrets had been misappropriated. *See* DTX 2157. U.S. Water alleged that “The pHyTOUT® Trade Secrets *have not been published or disclosed in the prosecution file for the pHyTOUT® Application*, do not appear in industry literature, and have not been demonstrated or taught by U.S. Water except to its customers who have entered into confidential non-disclosure agreements.” *Id.* at DTX 2157.006 ¶ 24. U.S. Water again identified as a trade secret “[t]he reduction in acid feed resulting from use of the pHyTOUT® system.” DTX 2158.001. Roy Johnson himself stated in a declaration that “more effective than acid feed” is “*not taught nor mentioned in the patent filing.*” DTX 2163.005 ¶ 13. Consistent with all of these documents, Roy Johnson admitted at trial that this concept *was* a trade secret, and *was not* disclosed in U.S. Water’s October 2007 patent application. Trial Tr. (Oct. 16, 2017 pm) (rough) at 130:21–131:9, 132:11–16, 133:14–18.

In light of U.S. Water’s party admissions that “reduced acid feed” was a trade secret, not disclosed in its priority patent application, written description simply cannot exist. In *Atlantic Research Marketing Systems, Inc. v. Troy*, the Federal Circuit wrote that the patentee cannot “‘have it both ways’ by reaching back and relying on the disclosures in the [asserted] patent to claim an invention he was purposely shielding from the public [as a trade secret].” 659 F.3d 1345, 1356 (Fed. Cir. 2011). But that is exactly what U.S. Water sought to do at trial. U.S. Water claimed that the “reduced acid feed” is a *patented* feature of the asserted patents, supported by a public disclosure on October 17, 2007. Also at trial, it admitted, through its witnesses and documentary evidence, that this same concept is a *trade secret*. But it cannot be

both things. “A trade secret is secret. A patent is not. That which is disclosed in a patent cannot be a trade secret.” *Id.* at 1357; *see also Amgen Inc. v. Sanofi, Aventisub LLC*, No. 2017-1480, 2017 WL 4413412, at *3–5 (Fed. Cir. Oct. 5, 2017) (reversing district court exclusion of post-issuance evidence as irrelevant to written description where the challenged evidence was offered to show the scope of the inventors’ disclosure). No reasonable juror could disregard U.S. Water’s admissions and instead conclude that the concept was *simultaneously* a trade secret *and* a public disclosure. Novozymes is therefore entitled to judgment as a matter of law that the patents lack written description.

Second, the “pH of 4.5 or higher” limitation also lacks written description for the independent, yet consistent, reason that this feature was not discovered by U.S. Water until March 2008 at the earliest, *five months after the priority date*. U.S. Water has taken the position that as of October 17, 2007, it “possessed” the complete invention—including the “pH of 4.5 or higher” limitation. Yet the evidence at trial showed that this is not the case.

On February 20, 2008, inventor Paul Young emailed the EPT group at U.S. Water attaching a document about “Phytase Value.” DTX 2364.001. As of February 20, the Phytase Value document makes no mention of pH or sulfuric acid. DTX 2364.002. A few weeks later, in an email exchange with Roy Johnson on March 8 and 9, 2008, Dr. Young said “*I had assumed that the advantage of phytase would be reducing scale while maintaining the same pH.*” However, the solubility of mag phosphate is so much greater than that of mag phytate, that we will still prevent scale at somewhat higher pH.” DTX 2495.001 (emphasis added). Then, on March 27, 2008, Dr. Young sent another email in which he stated that he has “expanded and updated my memo on determining the value of phytase to the customer” and asks whether the team has “[a]ny ideas on how we can put numbers to some of these benefits?” DTX 2363.001.

The attachment to the email identified, for the first time, reduced sulfuric acid use and possible higher pH in the beer column as a benefit to phytase. DTX 2363.002. U.S. Water’s realizations from February 20, 2008 to March 27, 2008 show that its inventors did not possess the limitation “pH of 4.5 or higher” at the time the parent application was filed. *See* Trial Tr. (Oct. 16, 2017 pm) (rough) at 48:25–49:6 (Dr. Kohl explaining that based on this evidence, the “realization Paul is ascribing happens March 9, 2008.”).

Roy Johnson’s testimony, too, confirmed that the original patent application did not disclose this limitation. He testified regarding an interview with the patent examiner, and admitted that he told the examiner that the new advantages of his invention include the reduction or elimination of aid, and the ability to operate at a higher pH in the beer column. *Id.* at 135:7–15. He also testified that U.S. Water simultaneously submitted new claims to describe these inventions. *Id.* at 135:17–19.

The written description requirement means that “the claims of the later-filed application must be supported by the written description in the parent in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought.” *Anascope*, 601 F.3d at 1333; *see also Amgen*, 2017 WL 4413412, at *3 (“To show invention, a patentee must convey in its disclosure that it ‘had possession of the claimed subject matter *as of the filing date*.’” (quoting *Ariad Pharms.*, 598 F.3d at 1350) (emphasis added))). U.S. Water did not comply with these requirements; the October 17, 2007 parent application contains no discussion of the “pH of 4.5 or higher” limitation, because the inventors did not even possess that invention until March 2008. No evidence supports a finding otherwise.

Therefore, for these two reasons, Novozymes is entitled to judgment as a matter of law that the “pH of 4.5 or higher” limitation lacks written description.

2. The “Substantially by Phytase and Not Acid with an Oxidizer” Limitation Lacks Written Description

The “substantially by phytase and not acid with an oxidizer” limitation appears in asserted claims 1, 5, and 7–9 of the ’399 patent. The limitation appears only in the ’399 patent; it was added when U.S. Water filed a continuation application on June 5, 2012.

For the same reasons described above, the October 17, 2007 parent application contains no support for any connection between the use of phytase and the elimination of sulfuric acid use (the same “reduced acid feed” concept discussed above). To the contrary, the email correspondence presented at trial establishes that the inventors did not possess or otherwise appreciate those alleged benefits until at least March 2008. *See* DTX 2495.001; DTX 2363.002 (March 27, 2008 document describing, for the first time, the benefits of “[d]eceased sulfur” and “less sulfuric acid”).

In addition, the evidence confirms that the specification does not contain adequate support for the notion that deposits are reduced “substantially by phyase and not acid with an oxidizer,” as every asserted claim of the ’399 patent requires. Dr. Kohl testified that the specification discusses three methods for reducing or eliminating deposits. *See* Trial Tr. (Oct. 16, 2017 pm) (rough) at 46:11–47:8. These methods are using an oxidizing agent, an acid combined with UV light, or an enzyme such as a phytase. *Id.* (testifying regarding DTX 2002.004 at 5:21–37). Importantly, Dr. Kohl explained that none of these options is described in a negative way or in a way that suggest the actual limitation. *Id.* at 47:13–15, 47:25–48:4.

The testimony of U.S. Water’s expert, Mr. Flanagan, *is no different*. He admitted to forming his opinion based on the same passage as Dr. Kohl. Trial Tr. (Oct. 17, 2017 pm) (rough) at 161:8–16. Like Dr. Kohl, Mr. Flanagan testified that this passage does not discourage a person of ordinary skill in the art from using one of the three methods over another. *Id.* at

161:17–24. Instead, Mr. Flanagan, like Dr. Kohl, concluded that this passage is simply listing “options” as opposed to describing “the merits of one versus another.” *Id.* at 161:21–162:7.

At trial, both parties’ experts opined on the same passage from the specification, and both parties’ experts characterized the passage in the same terms. This passage does not describe that the reduction of deposits must be accomplished substantially by phytase and not by acid in the presence of an oxidizer. Nor does it so much as explain why substantially eliminating acid from use to reduce formation of deposits is important or even relevant to the disclosed invention. Thus, this limitation lacks adequate written description support. *See Anascape*, 601 F.3d at 1355 (holding that the claims “must be supported by the written description in the parent in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention *as of the filing date sought*.” (emphasis added) (quotation omitted)).

No reasonable juror could conclude that the “pH of 4.5 or higher” and “substantially without acid” limitations are adequately supported in the face of all evidence to the contrary. The Court should find as a matter of law that these limitations lack adequate written description, and that the claims containing those limitations are invalid.

III. CONCLUSION

For the foregoing reasons, Novozymes respectfully requests that this Court grant its motion for judgment of invalidity as a matter of law.

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Respectfully submitted,

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